How to run Stile's Escape room: Hydrogen, fuel of the future

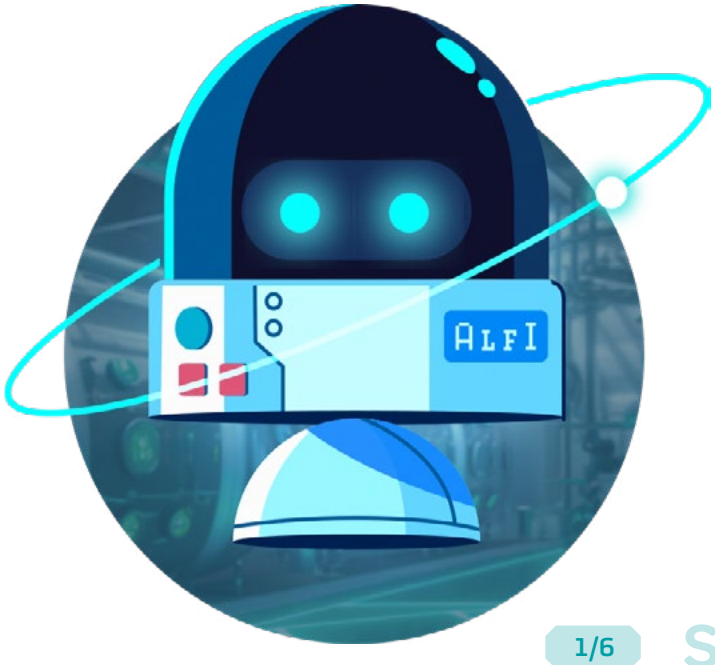
Stile's *Escape room: Escape room: Hydrogen, fuel of the future* is an immersive, hands-on experience for your students to complete during Science Week, or throughout the year. This engaging activity will get your students problem-solving as they move around the classroom.

How does it work?

Students work in teams to complete puzzles that have been set up around the room. Each puzzle has a code that can be entered into the simulation within the Stile lesson.

We recommend breaking the class into teams of 3–4 students. Each team should have their own device so that they can enter the codes into their own simulation. To prevent teams from manipulating the time on their simulations, you may like to keep these in a central location where you can keep an eye on them.

To suit the context, you may wish to encourage students to bring dress-up items that are appropriate for an engineer. Examples include high-visibility vests and hard hats.



Running order:

1. Play the introductory video.
2. Divide students into groups of 3–4.
3. Press play on the simulation. The countdown timer will begin. For added effect, unmute the audio of the simulation.
4. Students move around the room to find each of the eight Challenge Cards and their corresponding Activity Cards. They will need to use the instructions on the cards and the materials located at each activity station to solve each challenge. Solving a challenge will reveal a code, which then needs to be entered into the simulation. If the code is correct, the code will light up and the challenge icon will be unlocked.
5. The challenges are designed to be independent of one another. Students can complete them in any order. Remind students that after they have used the materials for a challenge and activity, they should reset them for the next group. Any used chemicals can be safely disposed of down the sink and flushed with running water. Remind students not to write on the Challenge or Activity Cards.
6. If students require a clue for a challenge, they can ask you for some help. Provide them with the corresponding Clue Card for that challenge. You can choose to apply a 2-minute penalty for each Clue Card using the button below the timer in the simulation.
7. On average, groups should complete each challenge in around five minutes. However, some of the practical challenges may take longer.
8. Once students have found all eight codes or the timer runs out, a video will play to conclude the session. You may wish to ask students to pause before entering their last code or pause their timer just before it runs out, so you can watch the video together as a class.

Risk assessment: stileapp.com/go/raescaperoomhydrogen

Materials:

CHALLENGE 1:

- 2 x graphite pencils
- 500 mL beaker
- 9 V battery
- 2 alligator clip wires
- water
- cardboard square to cover the beaker
- scissors
- 1/2 tsp salt
- teaspoon

CHALLENGE 2:

- 100 mL beaker
- 250 mL conical flask
- 20 mL hot water
- 50 mL hydrogen peroxide
- stirring rod
- 2 tbs dishwashing liquid
- 2 tsp yeast
- tablespoon
- teaspoon
- food colouring
- tray to catch spills
- paper towel
- 50 mL measuring cylinder
- lab coat
- safety glasses
- disposable gloves

CHALLENGE 3:

- balloon
- 3–4 m string or fishing line
- straw threaded onto the string
- sticky tape
- launch pad cut-out
- landing pad cut-out

CHALLENGE 6:

- calculator (optional)

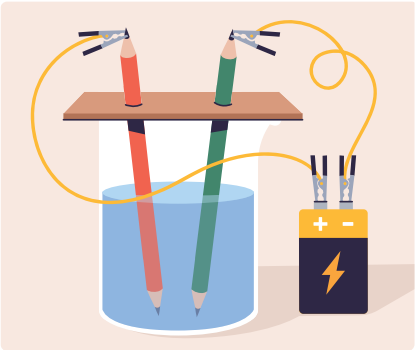
CHALLENGE 7:

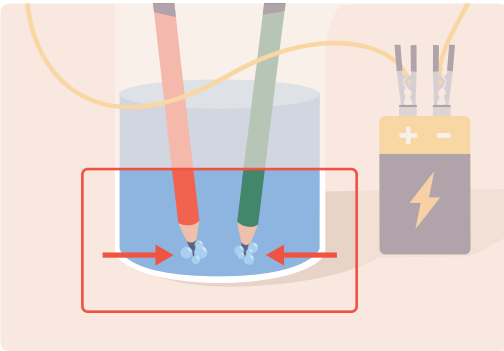
- ziplock bag
- ¼ slice of bread
- 3 tbs vinegar
- 1 tsp bicarbonate of soda
- scissors

Preparation:

1. Collect the required materials. Set up two stations for each challenge, as specified in the notes below. Make sure there are enough materials for each activity at all stations.
2. Place the corresponding Challenge Cards and Activity Cards at each station. Keep the Clue Cards and Answers.
3. Project the Stile lesson at the front of the room.
4. Before running the timed challenge section, remind students to reset each activity after they have completed it. All used chemicals can be safely disposed of in a sink and flushed with running water. Ask students not to write on the Challenge and Activity Cards. Students may use workbooks or scrap paper if they want to make notes or need space for working out when solving the challenges.

Setting up the challenges:





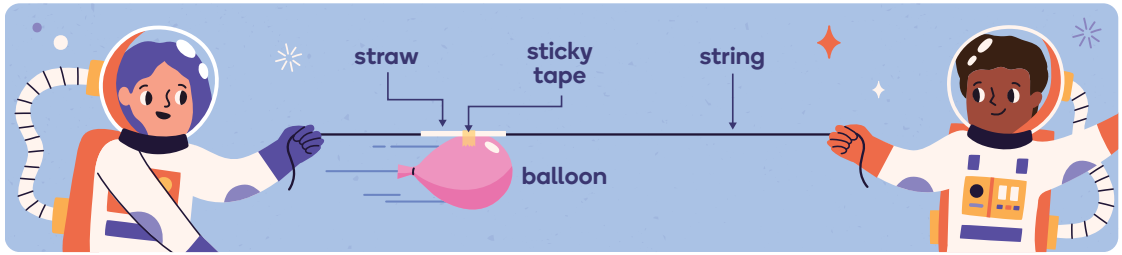
CHALLENGE 1:

Prepare the materials for the activity. Sharpen the pencils at both ends to expose the graphite. Students can reuse the same materials but will need to collect fresh water for their group. Students can reuse the same materials but will need to add fresh water and salt to the beaker for their group.

CHALLENGE 2:

Prepare the materials for the activity. Students can reuse the same equipment, except each group will need their own conical flask, measurement of hydrogen peroxide, yeast, hot water, dishwashing liquid and food colouring. Each student will need a lab coat, safety glasses and disposable gloves if handling the chemicals. If you wish to reduce the timing of this activity, you can prepare the measurements of the hydrogen peroxide for each group and have the students collect them from you before beginning the activity. To reduce the overall running time of the escape room, this activity can also be done as a teacher demonstration instead of groups completing it individually.

CHALLENGE 3:



Place the Challenge Card and Activity Card on separate desks in the classroom. These desks should be 3–4 m apart. Place the "launch pad" card next to the Challenge Card and the "landing zone" card next to the Activity Card. Cut a 3–4 m length of string. Place one end of the string near the "launch pad" and the other near the "landing zone". Thread the string through the straw so that the straw can move along the string. All groups can reuse these materials, except each group will need a new balloon and sticky tape. The materials can be placed next to the Challenge Card. Safety note: Students will need to hold this piece of string or line taut between the "launch pad" and the "landing zone". For this reason it's best to run this activity along one wall of the classroom so that it's not a hazard as other students move around the room.

CHALLENGE 4:

No additional preparation is required.

CHALLENGE 5:

Cut out the labelled cards with the deep-sea organisms. These will be reused by each group.

CHALLENGE 6:

You may wish to provide students with a calculatorto complete the equation in the activity.

CHALLENGE 7:

Prepare the materials for the activity. Each group of students will need all new materials, including a ziplock bag, ¼ slice of bread, 3 tbs vinegar and 1 tsp bicarbonate of soda.

CHALLENGE 8:

Cut out the labels for the water cycle. These will be reused.

Stile